

REMARKS

Entry of this Amendment and reconsideration and allowance are respectfully requested in view of the foregoing amendments and the following remarks.

Upon entry of this Amendment, claims 1-3, 7-15 and 18-25 and 27 will be pending in the application. Claim 6 has been cancelled, claim 27 has been newly added to more fully claim the invention as originally disclosed. No new matter was added.

At the outset, Applicants thank Examiner Shay for the courtesies extended to Applicants' representative during a personal interview conducted on May 29, 2002. The points discussed during the personal interview are incorporated into the remarks below and constitute Applicants' record of the interview.

Entry of this Amendment is proper under 37 CFR §1.116 since the Amendment: (a) places the application in condition for allowance (for the reasons discussed herein); (b) does not raise any new issue requiring further search and/or consideration (since the amendments to claims 1 and 19 add more clarity to the claims and amplify issues contained in the original claims); (c) satisfies a requirement of form asserted in the previous Office Action; and (d) places the application in better form for appeal, should an appeal be necessary. The Amendment is necessary and was not earlier presented because it was made in response, at least in part, to arguments raised in the Final Rejection. Entry of the Amendment is thus respectfully requested.

Furthermore, the finality of the Office Action is improper and should be withdrawn because the Office Action contains egregious errors (e.g., the Examiner confused the light output with electric power and the Examiner used a diameter value in the equation recited in the Office Action when a radius value should have been used) on which the Examiner relied to reject independent claims 1 and 19. Claims 1 and 19 specify a light flux or a pulse of at

least $250 \text{ J/cm}^2/\text{sec}$. If the Examiner had properly calculated the flux/pulse based on the Allemann et al. disclosure, the flux/pulse would have been either 55.7 or $111.4 \text{ J/cm}^2/\text{sec}$. Accordingly, the 102 (b) rejection of claims 1 and 19 based on the Allemann et al. is improper.

For example, on page 4, section 7, the Office Action explains that the fourth full paragraph in column 2 on page 821 of Allemann et al. discloses that a 1000 Watt (W) lamp is used to illuminate an area having a diameter of 8 millimeters (mm). The Office Action calculates an energy (flux) density equal to 497.6 W/cm^2 or $497.6 \text{ J/cm}^2/\text{sec}$ using the values 1000W and 8 mm and the formula $1000\text{W}/(((.8\text{cm}) \text{ squared}) (3.14))$. This calculation is not accurate based on the reasons set forth below.

The Office Action treats the 1000W associated with the lamp as the light output of the lamp. However, the unit Watt is for measuring electric power and does not relate to the light output level. For example, a Watt defines the rate of energy consumption by an electrical device when that device is in operation.

Applicant has attached copies of pages from a manual on Optoelectronics produced by Perkin Elmer that discloses "the conversion of electrical input power into radiated optical power for xenon flash lamps between 200 nm and 1100 nm is approximately 50%." Please see the tenth page of the Optoelectronics manual under the heading "Spectral Output." Although the conversion in the Optoelectronics manual is related to xenon flash lamps, the context of the Optoelectronics manual discusses xenon lamps both in a flash mode and a continuous mode. The same 50% conversion would apply if the xenon lamp were in a flash mode or a continuous mode. Thus, a 1000W lamp, such as the lamp disclosed in Allemann et al., would not have 1000 W of radiated optical power, as suggested by the Office Action, but rather would have about 50% of that amount.

Flux density is defined as the radiant power per unit area of the surface and is measured in Watts per unit area. The area of a circle is defined as πr^2 , where π is about 3.14 and where r is the radius of the circle. Therefore, the value .8 cm in the above formula represents a diameter value and should be replaced by the value .4 cm, which correctly represents a radius value.

Furthermore, the Office Action fails to consider that the light output of Allemann et al. is heavily filtered to select a 50 nanometer (nm) wavelength band between the wavelengths of 650-700 nm. Please see the fourth full paragraph in column 2 on page 821 of Allemann et al. Assuming that the energy (500 W based upon the above conversion) is spread evenly across the wavelength band of 200 nm – 1100 nm, the energy associated with a 50 nm waveband would equal about 28W, or about 5.6% of the total energy spread across the wavelength band 200-1100 nm. Thus, the calculation recited in the Office Action can be modified to show that Allemann et al. discloses an energy (flux) density equal to $28W / ((.4\text{cm})^2 (3.14))$, or about $55.7 \text{ J/cm}^2/\text{sec}$.

Even if the above conversion is ignored, which it should not be, the energy associated with a 50 nm waveband would equal about 56W, or about 5.6% of the total energy (1000W) spread across the wavelength band 200-1100 nm. Thus, the calculation recited in the Office Action can be modified to show that Allemann et al. discloses an energy (flux) density equal to at most $56W / ((.4\text{cm})^2 (3.14))$, or about $111.4 \text{ J/cm}^2/\text{sec}$.

Therefore, the finality of the Office Action should be withdrawn.

Additionally, the finality of the Office Action should be withdrawn because the Final Office Action was issued prematurely, i.e., the Final Office Action was issued as the first action in response to the Applicant filing a Request for Continued Examination (RCE). Applicant filed the RCE in response to an Advisory Action dated September 27, 2001, in

which the Examiner indicated that Applicant's Amendment dated September 10, 2001 was not entered. However, since the Advisory Action indicated that no new issues were raised, the Applicant's Amendment should have been entered for appeal, if so desired. Therefore, the issuance of a First Action Final Rejection after Applicant filed a RCE is premature.

Withdrawal of the Final Rejection is respectfully requested.

Claims 1, 19, 22 and 23 were rejected under 35 U.S.C. §102(b) by Allemann et al. This rejection is respectfully traversed because Allemann et al. fails to disclose every element recited in the rejected claims.

As discussed above and during the personal interview, claims 1 and 19 are patentably distinguishable over Allemann et al. since Allemann et al. does not disclose a pulse/flux of at least $250 \text{ J/cm}^2/\text{sec}$. At best Allemann et al. teaches a pulse/flux of at least $55.7 \text{ J/cm}^2/\text{sec}$ (or $111.4 \text{ J/cm}^2/\text{sec}$ assuming the liberties taken by the Examiner are proper). To better distinguish over Allemann et al., claims 1 and 19 are amended to clarify that the flux/pulse is filtered. During the interview, the Examiner indicated that this feature clearly distinguishes over Allemann et al.

However, this does not present a new issue because, for example, claim 1 recites a filter for filtering undesired light output frequencies from said pulse to produce a filtered light pulse for application to said body. Thus, it is clear the claimed energy is in relation to a filtered pulse, as it is for application to a body. Further, claim 1 recites "wherein said filter comprises water for filtering out undesired skin heating wavelengths of light and said light pulse has an energy of at least $250 \text{ J/cm}^2/\text{sec}$," which makes clear that the pulse is related to the filter. These recitations in claim 1, especially in combination with any reading of the specification (e.g., Figs. 2 and 3 and the corresponding description thereof), clearly teach one skilled in the art that the light pulse having an energy of at least $250 \text{ J/cm}^2/\text{sec}$ is filtered.

Similarly, the recitation of a filter and a light flux of at least $250 \text{ J/cm}^2/\text{sec}$ in claim 19, especially in combination with any reading of the specification, would clearly teach one skilled in the art that the light flux of at least $250 \text{ J/cm}^2/\text{sec}$ is filtered. Thus, no new issues are raised.

Accordingly, withdrawal and reconsideration of the rejection of claims 1 and 19 are respectfully requested.

Claims 22 and 23 are allowable by virtue of their dependence on claim 1, and also for their recitation of additional patentable features.

Claims 7-9 were rejected under 35 U.S.C. §102(b) by Gustafsson. This rejection is respectfully traversed because Gustafsson does not disclose every feature recited in the rejected claims.

Claim 7 is directed to an apparatus for producing a pulse of light including a housing, a light path out of the housing, a gas filled arc lamp light source within the housing operable to produce the pulse of light, and a filter for filtering undesired light output frequencies from the pulse positioned in the light path from the light source so as to receive light and to output filtered light to exit the housing. The filter includes a liquid within a conduit and the apparatus further includes means defining a flow path for the liquid, a part of the flow path being constituted by the conduit, and means for passing the liquid through the flow path.

Gustafsson does not disclose the apparatus for producing a pulse of light having a filter as recited in claim 7. For example, in Fig. 3 of Gustafsson, a xenon flash tube is positioned within a cavity containing water. The cavity also contains a pipe 71 containing a material designed to accept light of one frequency and to transform it into light of another frequency. The Rhodamin material, which is present in the pipe 71, is not an optical filter because it is an active material which is a secondary light emitter in the system. The water

does not serve the purpose of an optical filter, but is present as a cooling liquid. The water serving as a cooling material is not present in the light path for the output of light from the device itself, which is attached at the end of pipe 71, and thus cannot be an optical filter.

In contrast, the filter as recited in claim 7 filters undesired light output frequencies from the pulse positioned in the light path from the light source so as to receive light and to output filtered light to exit the housing. Gustafsson does not disclose a filter, as recited in claim 7.

Further, the Office Action states that only blue-green light is absorbed and re-emitted in the Gustafsson device, while all other wavelengths (e.g., red and yellow) would not be absorbed and would pass out of the device. Applicant respectfully disagrees with this assertion for the following reasons.

In Gustafsson, the light which exits the flash tube 20 is not the same light which exits the housing without passing through the water due to the absorption and reemission of light by the rhodamin material in the pipe 71. In Fig. 4 of Gustafsson, for example, light can be emitted from the housing through total internal reflection. For light to be totally internally reflected within the pipe 71, light must be emitted by the rhodamin contained in the pipe 71.

Due to total internal reflection, if other light wavelengths, such as either red or yellow light, were to be emitted from the flash tube 20, that red or yellow light would impinge on the pipe 71 at an angle that is either greater or less than the critical angle. If that angle is greater than the critical angle, the light would pass into the pipe 71 and would also pass across the pipe and impinge on the opposite side of the pipe 71 at the same angle. Because these angles are less than the critical angle, the light will pass out of the tube 71 and into the water 12. This is similar to the reflection angle shown in Fig. 4A of Gustafsson.

On the other hand, if the angle which the light impinges on the pipe 71 is less than the critical angle, the light will not enter the pipe 71, but will be reflected off its exterior surface. Thus, whether either red or yellow light is emitted from the flash tube 20, the red or yellow light will not pass out of the housing, but rather will be consumed by the repeated reflection and absorption within the water 12 of the device, being turned into heat.

For the reasons set forth above, Gustafsson does not disclose the apparatus for producing a pulse of light as recited in claim 7. Accordingly, withdrawal of the rejection of claim 7 is respectfully requested. Claims 8 and 9 are allowable by virtue of their dependence on claim 7, and also for their recitation of additional patentable features.

Claims 1-3, 5, 7-10, 13-15 and 19 were rejected under 35 U.S.C. §102(e) by Anderson et al. This rejection is respectfully traversed because Anderson et al. does not disclose every feature recited in the rejected claims.

Anderson et al. does not disclose the apparatus as claimed in independent claims 1 and 19 because Anderson et al. fails to disclose an apparatus capable of producing a filtered light pulse having an energy of at least $250 \text{ J/cm}^2/\text{sec}$, as recited in independent claim 1, or a filtered light flux of at least $250 \text{ J/cm}^2/\text{sec}$, as recited in independent claim 19.

Further, Anderson does not disclose the apparatus as claimed in independent claims 1, 7 and 19 because the light source in Anderson et al. is a laser and the light source recited in claims 1, 7, and 19 is a gas filled arc lamp light source. The Office Action asserts that the flash lamps are recognized equivalents of lasers in the art. However, Applicant respectfully disagrees because one cannot substitute a flash lamp for a laser in an apparatus without making other adjustments. For example, since lasers produce a monochromatic light output, no filters are needed to obtain a desired wavelength. However, filters could be used to obtain a desired wavelength of light produced by a flash lamp. The Examiner is requested to

produce a document, patent or otherwise, so that Applicants may assess its teachings and whether that reference is combinable with Anderson et al. See MPEP 2144.03.

The filter which includes water of claims 1, 7, and 19 serves to filter out unwanted wavelengths from the light output of the arc lamp. This will not be achieved in Anderson because the wavelength of the laser will be such that it is not filtered out by the cooling water flowing through the applicator head. If it was, there would of course be no remaining light energy to apply. The water cooling flow in the device of Anderson is not present for filtering out undesired skin heating wavelengths of light.

Further, the water disclosed in Anderson is contained in an irradiating unit 18, which is in a separate "housing" or enclosure from the light source 12. In contrast, claim 7 requires the filter comprising liquid to be positioned in the housing and interposed between the light source and the exit of the housing. Anderson et al. does not disclose the filter, as recited in claim 7.

Anderson et al. does disclose a flash lamp in column 10, lines 6-8, however, the flash lamp does not perform the same function as the gas filled arc lamp recited in claims 1, 7 and 19. In Anderson et al., the light output of the flash lamp does not exit the laser, but rather is used to initiate excitation of the lasing material of the laser into a state in which the laser can commence to lase. In contrast, the gas filled arc lamp light source, as recited in claims 1, 7 and 19, is provided to produce a pulse of light which is filtered and emitted through an aperture of the respective apparatus recited in claims 1, 7 and 19.

Withdrawal of the rejection of claims 1, 7 and 19 is respectfully requested.

New dependent claim 27 recites "wherein said pulse of light is substantially only filtered by the liquid," which was favorably received by the Examiner during the interview with respect to the Gustafsson and Anderson et al. references.

Accordingly, claims 2, 3, 10, and 13-15 are allowable by virtue of their dependence on claim 1, and also for their recitation of additional patentable features. Claims 8 and 9 are allowable by virtue of their dependence on claim 7, and also for their recitation of additional patentable features. Furthermore, claim 3 recites that the light source forms part of the means defining the flow path for water, whereby the water acts both to filter the light pulse and to cool the light source. This is clearly not a feature of the device of Anderson in which the light source is remote from the cooling flow of water and is in optical communication with the water through the fiber optic 16.

Claims 2, 3, 10-12, 20 and 21 were rejected under 35 U.S.C. §103(a) over Allemann et al. in combination with Gustafsson. This rejection is respectfully traversed because Gustafsson does not remedy the deficiencies of Allemann et al. with respect to the features recited in claim 1.

The combination of Allemann et al. and Gustafsson does not teach or suggest an apparatus capable of producing a filtered light pulse having an energy of at least 250 J/cm²/sec, as recited in independent claim 1, or a filtered light flux of at least 250 J/cm²/sec, as recited in independent claim 19. Accordingly, claims 2, 3, and 10-12 are allowable by virtue of their dependence on claim 1, and also for their recitation of additional patentable features. Claims 20-21 are allowable by virtue of their dependence on claim 19, and also for their recitation of additional patentable features. Withdrawal of this rejection is respectfully requested.

Claims 24 and 25 were rejected under 35 U.S.C. §103(a) over Allemann in combination with Anderson and Mass. This rejection is respectfully traversed because Anderson et al. and Mass do not remedy the deficiencies of Allemann et al. with respect to the features recited in claim 1.

The combination of Allemann et al., Anderson et al. and Mass does not teach or suggest an apparatus capable of producing a filtered light pulse having an energy of at least $250 \text{ J/cm}^2/\text{sec}$, as recited in independent claim 1. Accordingly, claims 24 and 25 are allowable by virtue of their dependence, either directly or indirectly, on claim 1, and also for their recitation of additional patentable features. Withdrawal of this rejection is respectfully requested.

Claim 18 was rejected under 35 U.S.C. §103(a) over Allemann as applied to claim 1 above, and further in view of Vassiliadis et al. This rejection is respectfully traversed because Vassiliadis et al. does not remedy the deficiencies of Allemann et al. with respect to the features recited in claim 1.

The combination of Allemann et al. and Vassiliadis et al. does not teach or suggest an apparatus capable of producing a filtered light pulse having an energy of at least $250 \text{ J/cm}^2/\text{sec}$, as recited in independent claim 1. Accordingly, claim 18 is allowable by virtue of its dependence on claim 1, and also for its recitation of additional patentable features. Withdrawal of this rejection is respectfully requested.

All objections and rejections have been addressed. It is respectfully submitted that the present application is now in condition for allowance.

Should the Examiner believe that anything further is desirable to place the application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached Appendix is captioned **"Version with markings to show changes made"**.

Respectfully submitted,

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Enclosures:

Copies of Pages from Optoelectronics manual produced by Perkin Elmer
Appendix

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claim 6 is cancelled.

Please amend claims 1 and 19 as follows:

1. (Twice Amended) Apparatus for producing a pulse of light for use in cosmetic or therapeutic photo-treatment of the human or animal body, comprising a housing, a gas filled arc lamp light source within said housing operable to produce said pulse of light, a light output aperture defined by said housing, and a filter for filtering undesired light output frequencies from said pulse to produce a filtered light pulse for application to said body, at least part of said filter being interposed between said light source and said aperture, wherein said filter comprises water for filtering out undesired skin heating wavelengths of light and said filtered light pulse has an energy of at least $250 \text{ J/cm}^2/\text{sec}$.

19. (Twice Amended) Apparatus for photo-treatment comprising a gas filled arc lamp light source, a filter having light filtration characteristics such that said filter passes only selected wavelengths of light disposed in a light path from said light source, said light source being adapted to produce a filtered light flux of at least $250 \text{ J/cm}^2/\text{sec}$, wherein said filter is a non-interference absorption filter.

New claim 27 is added.